cultivation at the tail-ends of the Kodayar irrigation channels where the crop frequently suffers from drought. These experiments have been fruitful of practical results. The experiment of annual, as opposed to biennial, cultivation of *punja* lands was successfully repeated for the fifth time at the experimental *punja* farm at Alleppey. The department is now demonstrating the success of this experiment in four more places, *viz.*, Kumarakam, Vembanad New Reclamation, Ramankari and Karumadi. Dr. Kunjan Pillai reports that already 3,500 acres of *punja* lands which would have remained fallow under normal conditions, were cultivated by the ryots during 1097, as a result of the experiments conducted at the Alleppey farm. Demonstrations of improved methods of cultivating paddy were conducted on ryots' lands in as many as 34 centres during the year, resulting in an increased average net profit of Rs. 17 per acre. There are extensive areas of lands in Central and North Travancore which, if reclaimed, would substantially increase the production of paddy in the country. The problems involved in their reclamation, however, are more biological than chemical, and with a view to successfully tackle them Government have decided to give a course of training in bacteriology to the Ag. Agricultural Chemist in the Agricultural Research Institute at Pusa. Demonstrations were conducted in the cocoanut farm at Alleppey to show how sandy wastes could be profitably converted into cocoanut gardens, with the result that already a large extent of such lands in the neighbourhood has been successfully planted with cocoanut. It is now proposed to open a fresh cocoanut demonstration farm at Vaikam. It is also proposed to open a ginger farm at Ettumanur to improve the cultivation of that important commercial crop. The development of fruit cultivation is another matter engaging the earnest attention of the department. Arrangements in regard to the opening of a fruit farm in South Travancore have been completed and the Director has been instructed to open one or more fruit farms on the High Ranges to try experiments in grafting and budding in the case of the jack and the mango and to extend the cultivation of pine-apple, for which there is great scope, with a view to create facilities for the eventual establishment of a canning industry. Successful demonstrations were given with the Fordson tractor both on wet and on dry lands where the soil was not heavy clay. Manures to the value of more than Rs. 56,000 were sold during 1097 by departmental and private agencies, to the latter of which a liberal commission is allowed. Arrangements have been made for the employment of Co-operative Societies as sub-agents for the sale of manure, and six Societies have already started on this work, one advantage of the system being that these Societies can sell manure to their members on credit and realise the cost in easy instalments. The Agricultural Middle School at Alwaye, referred to in paragraph 12 of my Address last year, was opened on the 1st Edavam, 1097, the class consisting of 4 departmental subordinates and 28 outsiders. A farm and a workshop are attached to the school and instruction is imparted in Malayalam in both the theory and the practice of agriculture, prominence being given to field work. The period of training is two years. Sustained efforts at popularising the silk industry are being made and a block of lands comprising 200 acres in the Anad *pakuthi* of the Nedumangad taluk has been subdivided into five-acre plots and earmarked for assignment for mulberry cultivation to the pupils trained in silk-worm rearing, who are mostly drawn from the depressed classes. The overseer attached to the Silk Farm in Trivandrum has returned after a course of practical training in rug-making and carpet-weaving, and a provision of Rs. 2,000 has been allotted in the budget of the current year to enable these industries also to be taught to the pupils in the farm.

20. Fisheries.—Arrangements have been made at Nindakarai near Quilon, for conducting experiments in breeding and curing marine fish, and the number of fish-curing yards has risen from three to five. Fish-curing yards will also be opened shortly at Colachel and the Cape and an employé of the Fisheries Department has been deputed for training in fish-canning methods at Chaliyam in Malabar.

21. Industries.—The attention of the Department of Industries during the period under review has been mainly directed towards the investigation of conditions favourable to the establishment of new industries, the introduction

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of improved methods in existing industries, and the expansion of industrial and technical education. All the four foreign scholars who had been sent to England in 1917 returned on completion of their courses, and have been employed by the State. Mr. K. P. Padmanabha Menon, who has studied both electrical and mechanical engineering and has been appointed as the Industrial and Agricultural Engineer, has been busy with the investigation of certain aspects of the Kallar Hydro-Electric Scheme. A mixed committee appointed to re-examine this scheme after local inspection has submitted its report, and it is now under the consideration of Government. Mr. Padmanabha Menon also proposes to undertake an investigation into the calorific value of the different kinds of fuel available in the State with a view to determine their power-producing capacity and comparative cost. An investigation of the conditions under which Travancore factories are now getting power for their requirements and the formulation of suggestions for their obtaining power which would be both cheaper and conducive to the longer life of the machinery, as also a survey of the mechanical appliances now used in agriculture with a view to improve their efficiency, will form a further part of his programme. The work of the Chief Boiler Inspector has been transferred to him and he will be assisted by an overseer in this work. Mr. N. K. Padmanabha Pillai, the textile expert of the department, is charged with the duty of improving the cottage weaving industry which is already well-established in the country. He will demonstrate to cottage weavers the latest improvements in hand-looms and in the designing, dyeing and finishing of textiles, and carry on investigations into the possibilities of improving the coir industry, besides organising a textile museum. With a view to impart instruction in advanced weaving and demonstrate to the people textiles of an advanced type, it is in contemplation to open a central institute of textile technology and dyeing in the premises of the School of Arts, Trivandrum, under the immediate supervision of this officer. The necessary lands have been acquired and plans for buildings are under preparation. This institution, when opened, will be provided with power and handlooms, and also with a workshop and machines for warping, sizing, bleaching, dyeing and finishing, where the pupils will receive practical instruction in these processes. The institution will also have as its further object the introduction of improved hand-looms, the manufacture and supply of looms and its parts, and research work on the utilisation of fibres as textiles. Mr. C. Kumara Das, the oil chemist, proposes to conduct investigations into the possibility of establishing a large-scale soap factory on up-to-date lines in Travancore. He will also study the methods of extraction of the chief oils produced in the country to find out the best conditions of extraction and to carry on research work in respect of the several oils with a view to find out the most profitable methods of utilising them. Mr. A. K. George, the tanning expert, is engaged in selecting the site most favourable for starting a tannery in Travancore, for producing both vegetable-tanned and chrome-tanned leather, and with this object in view he has started a tanning survey of the State. He is also visiting the existing small tanneries and instructing their owners in the production of better leather; besides carrying on research work on tanning and dyeing leather.

22. The establishment of new industries, especially on a factory basis, is not susceptible of easy or quick achievement. Prolonged investigation has to be made in regard to the natural resources available for such industries, the possibilities of their development in particular localities, the condition and suitability of labour, the facilities for transport, and the demand for the output both in and outside the country. Much of the work of the experts of the department must necessarily depend for its success on the equipment of a suitable technical laboratory, and it is hoped that the provision of the laboratory annexe in the Arts College, to which I referred in paragraph 13 of my Address last year, will go a great way to meet this demand. This building is now ready and only the fittings remain to be put in. The Director of Industries has brought to the notice of Government the invention, as a result of the researches conducted by his Chemical Assistant, Mr. C. Kerala Varma, of a mixture which is considered suitable for the manufacture of good stoneware and the commercial possibilities of this invention are now under investigation. With a view to secure further help in industrial research, Government have sanctioned a grant of £100 per annum to the Imperial Institute, London, for a period of three

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years, in return for the undertaking by that Institute to analyse and report on any raw material that may be forwarded to it, and it is expected that the connection thus established with this well-known scientific institution will be productive of material advantage to the State. Among the minor industries to which the attention of the department had been directed, it may be mentioned that the shellac branch was closed at the end of 1097 as the result of investigations which disclosed that climatic conditions do not admit of the establishment of that industry on any large scale in this country, while the signs of the deterioration noticeable in the apicultural branch are apparently not due to climatic or other natural causes and call for the attention of the Director.

23. With a view to help small industrialists, a set of draft Rules were framed for the grant of industrial loans and published in the Gazette for public criticism. Under these Rules, it is proposed to grant loans not exceeding Rs. 2,500 in each case for the purchase of tools, machinery and other accessories, the extension of industrial buildings, and other closely connected purposes, the loans bearing interest at 6 per cent. per annum, and being payable in instalments spread over a period not exceeding 7 years. These Rules are now under issue in their final form and efforts will be made to give effect to them in the current year itself. A departmental depôt for the sale of loom accessories to cottage weavers has been opened at Nagercoil, and the peripatetic weaving instructor who is visiting cottage weavers in their own homes and demonstrating to them improvements in hand-loom weaving, has also been commissioned with the sale of loom accessories and spare parts in his circuits.

24. The provision for industrial and technical education in the country is making marked progress. Orders have issued sanctioning the reorganisation of the Carpentry School at Quilon under the designation of the Government Carpentry and Smithery School. The chief feature of this school will be the provision of an up-to-date workshop for imparting practical instruction to the pupils, side by side with theoretical teaching, both in carpentry and in smithery. With the S. M. R. V. Technical Institute at Nagercoil, the Sri Mulam Technical School at Trivandrum, the Carpentry and Smithery School at Quilon, and the Commercial School at Alleppey, Government have now provided four technical institutions of great practical value in the four premier towns of the State, each one of them being peculiarly suited to the requirements of the tract in which it is located. Government are glad to note that the Commercial School at Alleppey is rapidly gaining in popularity; the total number of pupils attending it at the end of 1097 being 112. Besides the above Governmental institutions, there are 37 aided and 39 unaided private recognised industrial schools for boys in the State. The importance of regularising grants-in-aid to these institutions and confining such aid to the really efficient among them has led to the appointment of a mixed committee to frame a set of draft grant-in-aid Rules for them. Under these Rules, grants may be awarded for the payment of salaries to teachers; purchase of furniture and permanent fittings; purchase of tools, machinery and other appliances; purchase, erection or extension of school-buildings; and payment of stipends to pupils and teachers under training. Provision has also been made for the encouragement of vocational night schools as well as industrial exhibitions and the award of foreign scholarships. These Rules are now receiving the scrutiny of Government.

25. The statistics compiled at the last two decennial censuses have yielded some interesting figures which go to show that, unlike in the Madras Presidency, the percentage of people in Travancore supported by industries and commerce is on the increase. While the percentage of the population of the State supported by agriculture has declined from 56 in 1911 to 54 in 1921, the percentage supported by industries and commerce has risen from 27 to 29 during the same period. The corresponding figures for Madras are 70 to 71 in the case of agriculture and 21 to 19 in the case of industries and commerce. There can, therefore, be little doubt that the industrial awakening in this country is greater than that in the adjoining British Indian Districts. The Sri Mulam Shashtyabdapurti Memorial Institute, which is to serve the purpose of an Industrial and Commercial Museum and Bureau of Information, will soon be installed in the building that is being erected for the purpose in a portion

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of the *maidan* to the east of the Public Offices in Trivandrum, and when it gets into working order, it is bound to afford considerable stimulus to the economic advancement of the country. The Government have also decided to take part in the British Empire Exhibition to be held in London in 1924 under the patronage of His Majesty the King Emperor. A committee composed of officials and non-officials, with the Director of Agriculture as the convener, has been constituted to work out the details, and it is proposed to hold a preliminary exhibition in Trivandrum at the time of His Highness the Maha Raja's next birth-day for the final selection of the exhibits to be sent to London. I appeal to you to heartily co-operate with the committee to make the State's participation in the project a complete success.

26. It may here be mentioned in passing that, with a view to encourage local products and manufactures, the Government have issued orders that, in the matter of purchasing stores required for departmental use, heads of departments should prefer Travancore products, provided they satisfy their requirements as regards quality and do not compare unfavourably with foreign products in regard to prices.

27. Geology.—The Department of Geology has been made a section of the Department of Industries with effect from the beginning of the current year. With a view to enable the staff of this section to carry on the work of prospecting for minerals of economic value more effectively, a Bill is being prepared by the Additional Head Sirkar Vakil empowering the staff to enter on private lands, if necessary. A programme of prospecting for and conducting an economic survey of minerals has been drawn up, and the Assistant Geologist has commenced to work at it and give the Chemical Assistant of the department the materials necessary for the ascertainment of mineral contents in the minerals prospected. The first volume of the Geological Records of Travancore has been published, and for the first time in the history of the State, concession to work for minerals of commercial value has been granted to sons of the soil. The allotment to the Department of Industries including Geology has been increased from Rs. 97,798 in 1096 to Rs. 1,86,500 in 1098.

28. Banking.—Orders were recently passed detailing the ideas of the Government in regard to the character and the constitution of the proposed State-aided Bank for Travancore and specifying the concessions which the Government were prepared to make in aid of it, and the proposals of the Government were referred to the Economic Development Board for its further remarks. In these proposals, Government have expressed themselves in favour of a bank worked by an indigenous agency as a purely non-official concern, they being satisfied with only one Director on the managing board with no power to vote and the State aid taking the shape of a substantial deposit. Only such conditions as are necessary for effectively watching the working of the banks are proposed to be imposed. A Joint Stock Company will have to be registered for the purpose in Travancore with a capital of Rs. 30 lakhs, divided into 60,000 shares of Rs. 50 each. Subject to a maximum of Rs. 5 lakhs, Government will deposit an amount in the Bank equal to the paid-up capital of the Company for a period of 5 years, one-half of that deposit bearing no interest at all and the other half bearing interest at the low rate of 4 per cent. The capital of the Company has, to start with, been deliberately kept low with a view to enable the people of the State to float the Bank easily, and it may well be increased later when the operations of the Bank justify such a course. The further remarks of the Economic Development Board have just been received and final orders will issue as early as possible, after a careful consideration of those remarks. It is earnestly hoped that the people of Travancore would evince the necessary practical enthusiasm for the early inauguration of this Bank.

29. There has not been much perceptible improvement in the working of indigenous banking concerns in the State. The Registrar of Joint Stock Companies has severely criticised their methods and has even suggested legislative interference with a view to protect the public from the evils of unsound banking methods. Government, however, do not propose to take any immediate action in the direction

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